Tanta University	Department: Computer and Control Engineering Total Marks: 75 Marks	Faculty of Engineering
Course Title: Microprocessors Date: January 2013 (First term)	Course Code: EC21 Allowed time: 3 hrs	Year: 2nd No. of Pages: (2)

Answer the following questions

Problem number (1) (18 Marks)

[a] Put (☑)or (x), then write correct statement (10 Marks)

1) The code segment is limited to 64 Kbytes in 80386.
2) In real mode, segments can begin at any location in the memory system.
3) PUSH BX is equivalent to PUSH EBX
4) MOV AX, DL
5) STD
6) MOV ES, DS
7) REP STOSB
8) AND AL, BL
9) LES BX, CAT
10) LEA CX,[BL] [BX]
11) IN DX IN AX, DX
12) PUSH 73_H

[b] Draw the internal architecture of the microprocessor 80286 then describe the use of all registers. (8 Marks)

Problem number (2) (17 Marks)

[a] For the following instructions determine the data addressing mode and define its function. (8 Marks)

Direct 1) MOV [1234_H], BX
Reg 2) DIV CH
Base + Index 3) ADD CL, [BX + DI]
relative reg 4) MOV ARRAY[BX], AX
reg indirect 5) MOV [BX], DH

[b] Comparison between: (9 Marks)

1) The real mode operation and the protected mode operation.
2) The 16-bit instruction mode and the 32-bit instruction mode.
3) LOOP instruction and JMP instruction.

Problem number (3) (20 Marks)

[a] In a machine language instruction, what is specified by the MOD field, the D and W bits found in some machine language instructions. (6 Marks)

[b] If a MOV DI, [BX +SI+ 30_H] instruction appears in a program, what is its machine language equivalent? (6 Marks)

Op-code MOV is 22_H			
R/M code	Addressing mode	Code	REG field
000	DS: [BX + SI]	011	BX
001	DS: [BX + DI]	110	SI
111	DS: [BX]	111	DI

[c] Describe the operation of each of the following instructions and the content of the destination operand in each instruction after execution assuming the initial values are DS =0200H, BX = 4F82H (8 Marks)

1) INC BX
2) SUB BH, 20_H
3) ROR BX, 2
4) AND BX,$F0FF_H$

Problem number (4) (20 Marks)

[a] Suppose that DS = 0400H, BX = 0300_H, SS = 0200_H, SP = 0001_H, and DI = 0400H. Determine the memory address accessed by each of the following instructions, assuming real mode operation: (7 Marks)

1) MOV CX, [1234_H]
2) PUSH BX
3) MOV DX, [BX]
4) INC BYTE PTR[BX]

[b] Explain the meaning of the following instructions: (13 Marks)

1) .MODEL SMALL
2) PUSHA
3) MOV BX, OFFSET DATS
4) CMOVS BX, DX
5) OUT DX, AX
6) OUTSB
7) DATAS DW 20 DUP(?)
8) MUL DI

مع أطيب الأمنيات بالتوفيق